ASRS Program Briefing

Aviation Safety Reporting System

ASRS

NASA

ASRS Program Briefing Index

ASRS Program Overview

Concept & Mission

The Aviation Safety Reporting System (ASRS) receives, processes and analyzes voluntarily submitted incident reports from pilots, air traffic controllers, dispatchers, cabin crew, maintenance technicians, and others. Reports submitted to ASRS may describe both unsafe occurrences and hazardous situations. Information is gathered from these reports and disseminated to stakeholders. ASRS's particular concern is the quality of human performance in the National Airspace System.

Reporting Incentives

VOLUNTARY

CONFIDENTIAL

NON-PUNITIVE
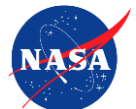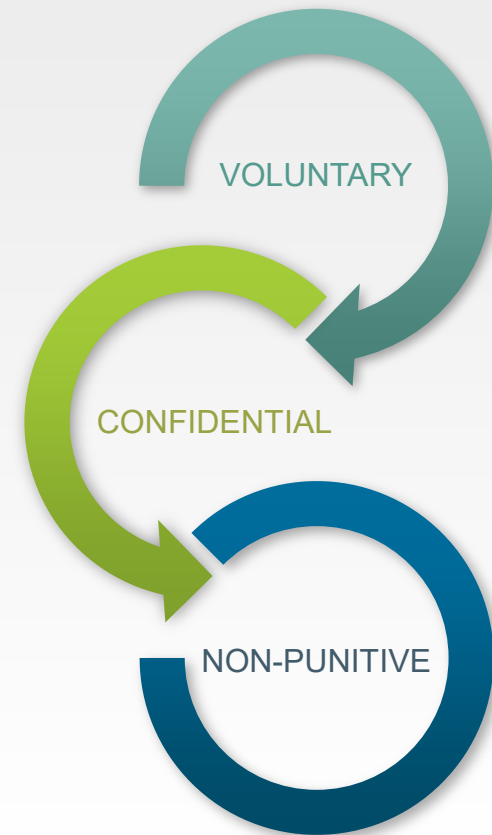
Purpose

- **Identify deficiencies and discrepancies in the National Airspace System**
  - Objective: Improve the current aviation system

- **Provide data for planning and improvements to the future National Airspace System**
  - Objective: Enhance the basis for human factors research and recommendations for future aviation procedures, operations, facilities, and equipment
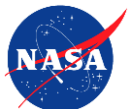
ASRS Background

|	
WW II	Industry and Military recognized value of voluntary incident reporting
1958	Need for U.S. Incident Data System raised during FAA Enactment Hearings
Oct. 1974	United Airlines incident foreshadowed TWA 514 Accident
Dec. 1974	TWA 514 Accident
Apr. 1975	Study of the National Air Transportation System as a Result of the Secretary's Task Force on the FAA Safety Mission
May 1975	Aviation Safety Reporting Program (ASRP) Implemented (FAA)
May 9, 1975	Advisory Circular 00-46A Issued
Apr. 1976	Aviation Safety Reporting System (ASRS) Established (NASA/FAA)
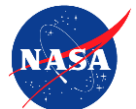
ASRS Staff

The ASRS Staff is composed of highly experienced pilots, air traffic controllers and mechanics, as well as a management team that possess aviation and human factors experience. ASRS Analysts' experience is comprised of over 600 cumulative years of aviation expertise covering the full spectrum of aviation activity: air carrier, corporate, military, and general aviation; Air Traffic Control in Towers, TRACONs, Centers, and Military Facilities. Analyst cumulative flight time exceeds 200,000 hours in over 50 different aircraft.

In addition, the ASRS Staff has human factors and psychology research experience in areas such as training, fatigue, crew resource management, user interface design, usability evaluations, and research methodology.
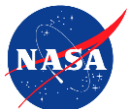
Documents Governing ASRS Immunity & Confidentiality

- Federal Register Notice, 1975 & 1976

- Federal Aviation Regulations Part 91.25 (14 CFR 91.25)

- FAA Advisory Circular 00-46E

- FAA policy concerning Air Traffic Controllers regarding ASRS reporting, FAA Order JO 7200.20
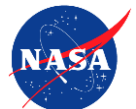
The Immunity Concept

Paragraph 9. c. FAA Advisory Circular No. 00-46E

C. **Enforcement Restrictions**. The FAA considers the filing of a report with NASA concerning an incident or occurrence involving a violation of 49 U.S.C. subtitle VII or the 14 CFR to be indicative of a constructive attitude. Such an attitude will tend to prevent future violations. Accordingly, although a finding of violation may be made, neither a civil penalty nor certificate suspension will be imposed if:

1.   The violation was inadvertent and not deliberate;

2.   The violation did not involve a criminal offense, accident, or action under 49 U.S.C. § 44709, which discloses a lack of qualification or competency, which is wholly excluded from this policy;

3.   The person has not been found in any prior FAA enforcement action to have committed a violation of 49 U.S.C. subtitle VII, or any regulation promulgated there for a period of 5 years prior to the date of occurrence; and

4.   The person proves that, within 10 days after the violation, or date when the person became aware or should have been aware of the violation, he or she completed and delivered or mailed a written report of the incident or occurrence to NASA.

ASRS Stakeholders
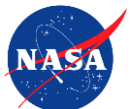
Report Processing

Report Intake Overview

ASRS receives reports from pilots, air traffic controllers, cabin crew, dispatchers, maintenance technicians, ground personnel and others involved in aviation operations.

ASRS's report intake has been robust from the first days of the program, in which it averaged approximately 400 reports per month. In recent years, report intake has grown at an enormous rate. Intake now averages over 2,000 reports per week and more than 8,251 reports per month.
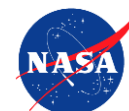
Report Intake Metrics

Monthly Report Intake
(January 1981 – December 2018)
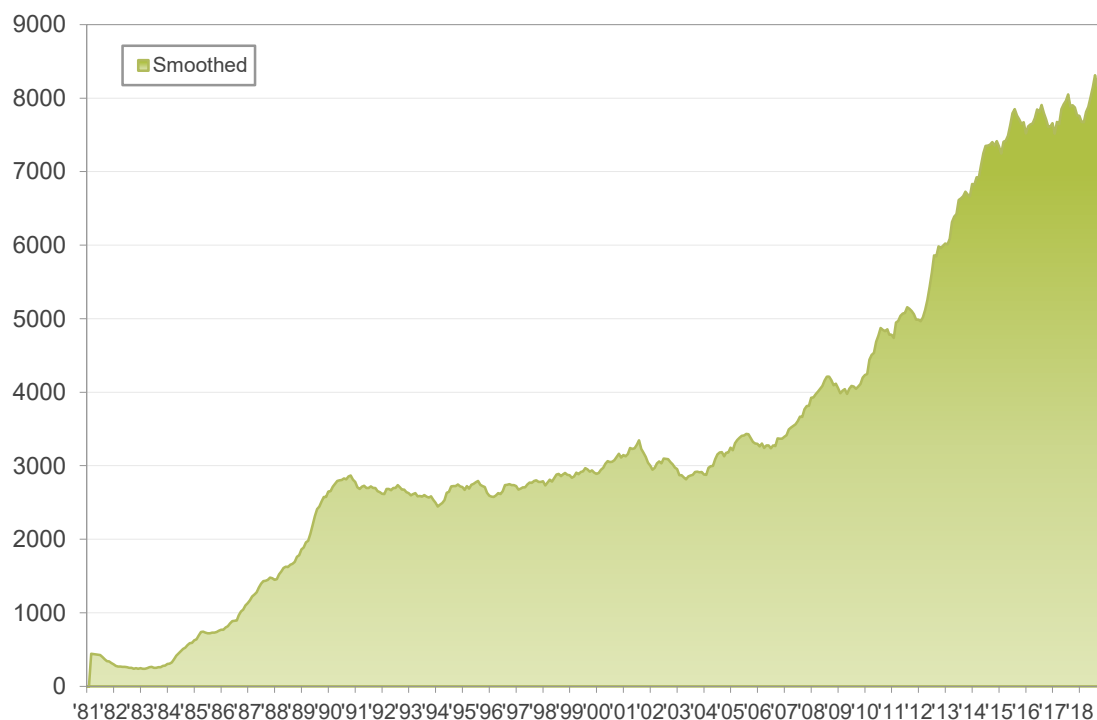
- Total Program Report Intake = **1,625,738**

- Total Report Intake for 2018 = **99,010**

- Averaging **8,251** reports per month, **396** per working day

Aviation Safety Reporting System

Incident Reporter Distribution

January 2009 – December 2018

| | 2009 48,986 | 2010 58,683 | 2011 61,018 | 2012 71,540 | 2013 80,840 | 2014 90,100 | 2015 92,228 | 2016 91,970 | 2017 94,302 | 2018 99,010 |

Legend: ■ Other ■ Dispatch ■ Maintenance ■ Ground ■ Air Taxi FLC ■ Cabin Crew ■ Gen Av FLC ■ Air Carrier FLC ■ Controller
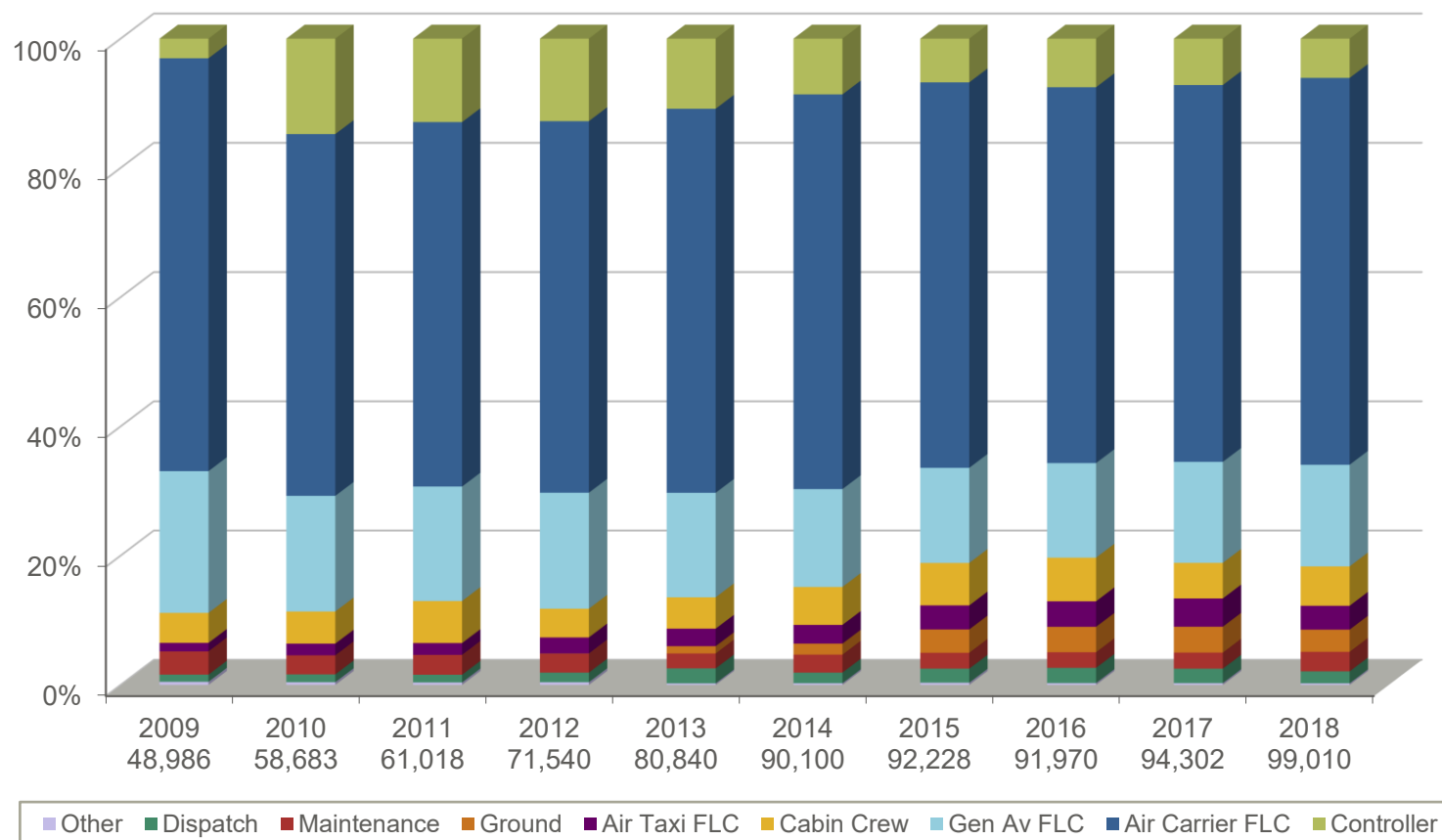
Report Processing Overview

ASRS has securely processed over 1.6 million reports in its 42 year history. The process contains critical elements that ensure each report is handled in a manner that maintains reporter confidentiality while maximizing the ability to accurately assess the safety value of each report. ASRS report processing begins with the receipt of reports through electronic submission or from the post office, and ends with the final coded report entering the ASRS Database.

Reports sent to the ASRS are widely regarded as one of the world's largest sources of information on aviation safety and human factors.
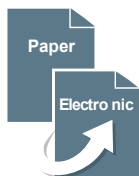
Report Processing Flow
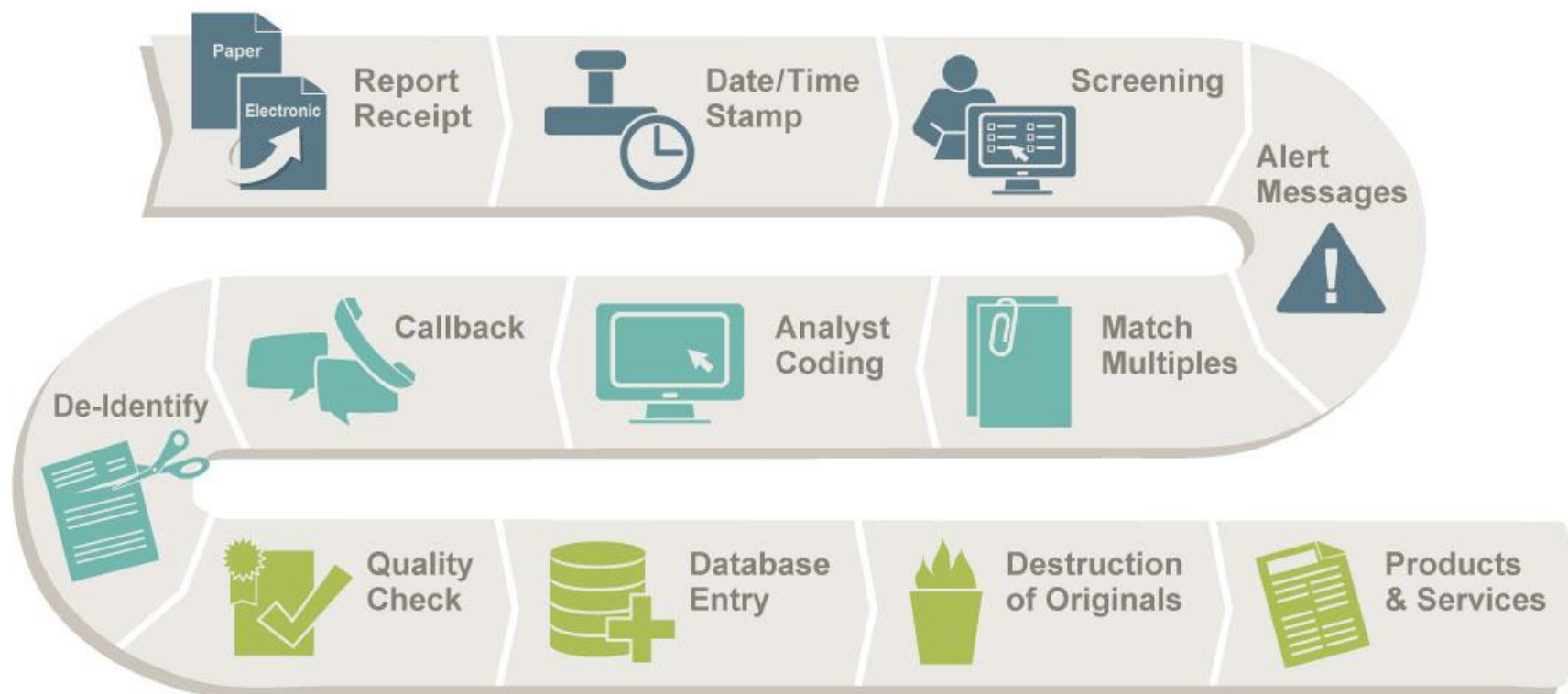
Report Processing Flow

ASRS paper reports are picked-up daily from the Moffett Field Post Office or are received electronically via website Electronic Report Submission (ERS) or ASAP data transmissions

Every report is date and time stamped based on the date of receipt

Two ASRS Analysts "screen" each report within three working days to provide initial categorization and to determine the triage of processing

ASRS Analysts may identify hazardous situations from reports and issue an Alert Message. De-identified information is provided to organizations in positions of authority for further evaluation and potential corrective actions
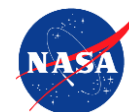
Report Processing Flow

ASRS retains high-level categorization of 100% of reports received. Based on initial categorization, multiple reports on the same event are brought together to form one database "record"

ASRS Analysts identify reports that require further analysis and entry into the public ASRS database. During the detailed Report Analysis process, reports are codified using the ASRS taxonomy.

An ASRS Analyst may choose to call a reporter on the telephone to clarify any information the reporter provided. This information is added to the analysis and final record.

To ensure confidentiality all identifying data is removed. After analysis, the Identification (ID) Strip, the top portion of the report, is returned to the reporter. This ID Strip acts as the reporter's proof of submittal. All physical and electronic ID Strip data with the reporter's name, address, date and time stamp is removed.

Report Processing Flow

All reports that receive further analysis go through a Final Check to assure coding accuracy. Quality Assurance checks are also performed for coding quality.

Final coded reports enter the ASRS Database. These de-identified records are then available in the ASRS Database Online, which is available through the ASRS website.

Original reports, both physical and electronic data, are destroyed to completely ensure confidentiality

ASRS uses the information it receives to promote aviation safety through a number of products and services, such as Alert Messages, Search Requests, a monthly newsletter, focused studies and more

Aviation Safety Reporting System

ASRS Products & Services

ALERT MESSAGES

Safety information issued to organizations in positions of authority for evaluation and possible corrective actions.

QUICK RESPONSES

Rapid data analysis by ASRS staff on safety issues with immediate operational importance generally limited to government agencies.

ASRS DATABASE

The public ASRS Database Online and data available in Database Report Sets or Search Requests full filled by ASRS staff.

CALLBACK NEWSLETTER

Monthly newsletter with a lessons learned format, available via website and email.

FOCUSED STUDIES

Studies/Research conducted on safety topics of interest in cooperation with aviation organizations.

ASRS Products & Services Metrics

April 1976 – December 2018

Significant Items	Quantity
Incident Reports Received	1,625,738
Safety Alert Messages	6,515
Quick Responses	144
Search Requests	7,561
CALLBACK Issues	467
ASRS Directline Issues	10
Research Studies	64

Aviation Safety Reporting System
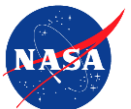
21
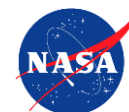
Alert Messages

Alert Message Overview

When ASRS receives a report describing a hazardous situation, for example, a defective navigation aid, an aircraft system anomaly, a confusing procedure, or any other circumstance which might compromise safe flight – an alerting message is issued using de-identified information provided in the reports.

Alerting messages have a single purpose: to relay safety information to organizations in positions of authority so that they can evaluate the information and take possible corrective actions.

Alert messages are classified as **Alert Bulletins** or **For Your Information Notices**, and may be included in monthly **ASRS Safety Teleconferences**.

ASRS Alerting Pyramid

Alert Bulletins — Time critical safety information issued to organizations in positions of authority for evaluation and possible corrective actions.

For Your Information Notices — Less urgent safety information is issued in For Your Information (FYI) Notices.

ASRS Safety Teleconferences & Other Safety Communications — Alert Bulletins and FYI Notices determined appropriate for an in-depth discussion are included in a monthly teleconference with the FAA and others.

ASRS has no direct authority to directly correct safety issues.
It acts through and with the cooperation of others.

Alerting Subjects

January 2008 – December 2018

Subject	Total
Aircraft Systems	650
Airports Facility Status and Maintenance	410
Other	250
ATC Procedures	220
Airport Lighting and Approach Aids	114
ATC Equipment	104
Hazards to Flight	77
ATC Operations	57
Navigation	56
Aircraft Avionics	36
Aircraft Power Plants	28
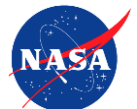
Alerting Responses

January 2008 – December 2018

Response	Percentage
Action taken as a result of the AB/FYI	20%
Action initiated before AB/FYI received	15%
Action initiated in response to AB/FYI but not completed	13%
Addressee agrees with AB/FYI but unable to resolve	4%
Issue raised by AB/FYI under investigation	3%
Addressee disputes factual accuracy of AB/FYI	17%
Information in AB/FYI insufficient for action	14%
Addressee in factual agreement but sees no problem	8%
Action not within addressee's jurisdiction	4%
For information only, no response expected	2%

Total 55%

Examples of Safety Alerting Success

- **Similar Sounding Fix Names YELLA/YELAH (FYI 2018-12)**
The FAA (ZLA-530) office responded and stated "We would like to thank you for the information we were given regarding similar fix names for correction. The 2 fixes in ZLA airspace, YELLA and YELAH were found to be a problem for ATC. As such, one of the fix names was changed to alleviate any further problems. We appreciate the work that is being done to "clean up" some of the items that ATC identifies while performing their duties. As you continue to assist in identifying problems, we will work in conjunction to make the necessary changes."

- **SBGL PAPI Display Runway 28 (FYI 2018-107)**
Rio de Janeiro - Galeao International Airport personnel responded and stated "We are grateful for your information about SBGL PAPI display RWY 28. As for the report...the pilot reports difference between the PAPI on the right and left sides. ....an inspection flight was performed by GEIV (Brazilian Air Force Special Flight Inspection Group), in which the difference was identified. ...adjustments were made."

- **SAT Airspace VFR/IFR Traffic Conflicts (FYI 2018-54)**
FAA (ATM SAT TRACON) office responded and stated "The San Antonio ATC team appreciates receiving the NASA ASRS alerts. In this particular case, it supports our ongoing effort to mitigate known safety risk(s) associated with the subject airport, i.e. 5C1. In the case of an unknown safety concern, a report such as this would be instrumental in raising awareness of potential risk."
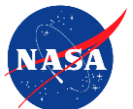
Quick Responses

Quick Response Overview

Quick Responses are rapid turnaround data analysis that are typically accomplished within two to ten business days of the request. They are a high value service directed towards safety issues with immediate operational importance. Quick Responses are generally limited to government agencies such as FAA, DOT, NTSB, NASA, and U.S. Congress.
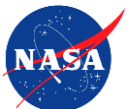
Quick Response Applications

- An Analysis of Unmanned Aerial Vehicle (UAV) Related Incidents

- An Analysis of NOTAM Related Incidents

- An Analysis of Flight Service Station Related Incidents

- An Analysis of General Aviation ADS-B Related Incidents

- An Analysis of Part 121 Similar Call Sign Related Incidents

ASRS Database

Search Requests

Information in the ASRS Database is available publicly. The ASRS will provide **Search Requests** to members of the aviation community. ASRS will search its database, download relevant reports, and send to requestor.

Since the inception of ASRS, over **7,561** Search Requests (SRs) have been directly provided by ASRS Research Staff to various aviation organizations and agencies, as well as individuals through December 2018.
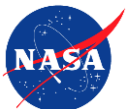
Search Requestors by Organization

January 2008 – December 2018

Organization	Total
FAA	170
Air Carriers	86
NASA	73
NTSB	65
Media	59
Alphabet Groups	48
Miscellaneous Safety Organizations	24
Other	18
Individuals	16

Organization	Total
Research Organizations	14
Student	12
Miscellaneous Government	11
Foreign	9
Aircraft Manufacturers	8
Military	5
Law Firms	3
Educational Institutes	3
DHS	2

Recent Search Request Samples

- **B737 Series Pitot Static System Related Airspeed and/or Altitude Indication Issues (SR 7279)**
  - Completed for the NTSB

- **Performance-Based Navigation Incidents (SR 7280)**
  - Completed for the FAA (ANG-C1), NextGen Human Factors Division

- **Hazardous Materials Related Incidents (SR7278)**
  - Completed for FAA (AXH-1), Office of Hazardous Materials Safety

- **Loss of GPS Signal Events (SR 7274)**
  - Completed for AOPA

ASRS Database Online

Direct access to search de-identified reports in the ASRS database is available through **ASRS Database Online (DBOL)** at https://asrs.arc.nasa.gov/search/database.html.

- Over **1,600** queries are completed each month

- More than **230,368** DBOL queries completed since its launch in July 2006

ASRS Database Report Sets

For your convenience, selected relevant reports on several safety topics are available on the website called **ASRS Database Report Sets**. Each report set consists of 50 ASRS Database records, all pre-screened to assure their relevance to the pre-selected topic and are available at https://asrs.arc.nasa.gov/search/reportsets.html.

From the ASRS website, ASRS Database Report Sets are downloaded on average over **3,079** times a month, Report Sets were first posted in January 2000.

ASRS Database Report Sets

2018 Top Ten Report Sets

| Report Set Topic	Total Downloads
Unmanned Aerial Vehicle (UAV) Reports	11,599
Passenger Electronic Devices	3,273
Flight Attendant Reports	1,756
Cabin Smoke, Fire, Fumes, or Odor Incidents	1,685
Passenger Misconduct Reports	1,288
Cockpit Resource Management (CRM) Issues	1,190
Air Carrier (FAR 121) Flight Crew Fatigue Reports	1,178
Maintenance Reports	1,080
Altitude Deviations	1,028
Runway Incursions	822

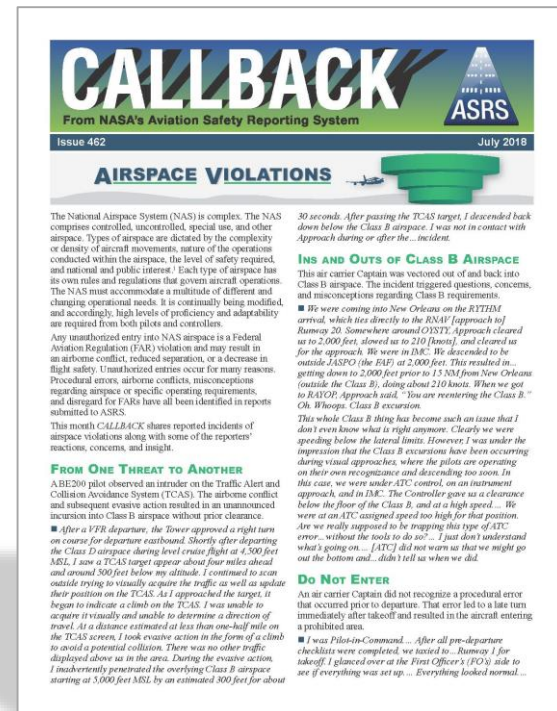# *CALLBACK*

CALLBACK Overview

CALLBACK, the award winning ASRS monthly safety newsletter, has been published since 1979 in a popular "lessons learned" format. *CALLBACK* presents ASRS report excerpts that are significant, educational, and timely. Occasionally features on ASRS program developments and research are also presented. Over 467 issues have been published and distributed throughout the U.S. and to the international aviation community. All issues since December 1994 are available for download at the ASRS website at:

https://asrs.arc.nasa.gov/publications/callback.html
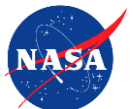
CALLBACK Distribution and Subscription

- In addition to being published online, *CALLBACK* is distributed by email. Subscription is free and available via the ASRS website.

- The total number of email subscribers for 2018 was over **30,300**

- *CALLBACK* views for 2018 (HTML and PDF) were over **243,950**

CALLBACK Topics

2018 *CALLBACK* Topics Covered

- Airspace Violations
- Climb and Descend "Via" Clearances
- Cockpit Decisions
- Crew Management During Passenger Circumstances
- Electronic Flight Bag (EFB) Anomalies
- Go-Around Incidents
- Interactive Situational Resolutions
- NMAC and Critical Ground Conflict
- Non-Towered Airport Incidents
- Operating Mode Issues
- Resolution Advisories and Traffic Insight

Electing the Electronic Flight Bag

Issue 459, April

Those Go-Arounds We Wish Were Better

Issue 463, August

Climb Via and Descend Via

Issue 467, December

Aviation Community Feedback

Sample Reader Comments from 2018

*"Great publication. Been reading it every month for over 20 years. Keep up the good work.*

"The ASRS program and its CALLBACK publications have always been class-act products from our government. Intuitively, we all sense the magnitude of the effectiveness of your team's work. Some measures are quantifiable; alas, like in some other disciplines (law enforcement, for example), some may be difficult to quantify directly. (e.g., How many accidents did we prevent today?) Well, I think ASRS prevents many."

I love CALLBACK. As the son of a professional pilot, I started reading your publication in the 90s during High School and have gained keen insights and learned so much from the publication over the years. It truly has made me a more professional pilot and I'm glad to participate in the circle of learning through ASRS & ASAP reports within my own airline.
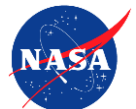
Focused Studies/Research

Focused on Operations and Human Factors

- 64 Research Studies and Special Papers Published

  - **Operations:** Deviations, De-Icing/Anti-Icing, Rejected Takeoffs, Clearances, Weather Encounters, Landing Incidents, Runway Transgressions, TCAS II, Crossing Restrictions, etc.

  - **Human Factors:** Communication, Memory, Confusion, Time Pressure, Judgment, Training, Crew Performance, Flight Crew Monitoring, etc.

  - **Confidential Reporting:** ASRS Reporting Model, Case for Confidential Reporting, Development of ASRS, Cross Industry Applications, etc.

- Research agendas are developed in collaboration with government and industry safety organizations

- There are over 30 ASRS Research Papers available to download on the ASRS website
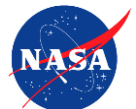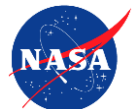
Focused Study – Wake Vortex

Wake Vortex Encounter Study

In cooperation with the FAA, ASRS is currently examining Wake Vortex Encounter incidents reported to ASRS. ASRS began this study in 2007 and will continue through 2019. At present the Wake Vortex Encounter Study includes all airspace within the United States, enroute and terminal. In quarterly reports, the ASRS documents event dynamics and contributing factors underlying unique wake vortex encounter incidents.

A sampling of the factors to be analyzed includes reporters' assessed magnitude of wake encounter, aircraft spacing, aircraft type, runway configuration, and consequences from the encounter.
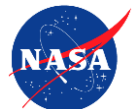
Focused Study – AIS Data Link

Meteorological and Aeronautical Information Services Data Link Services and Applications Study

In cooperation with the FAA, ASRS is conducting a study focused on meteorological and aeronautical information services (AIS) via data link. ASRS is gathering reports of incidents that occurred while pilots were utilizing weather or AIS information in the cockpit (textual and/or graphical) obtained via data link (including ACARS) or other sources on the ground or in the air.
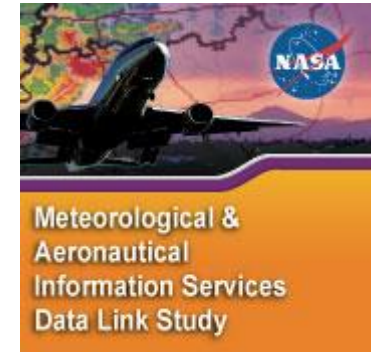
Some factors to be analyzed include type of weather data received, cockpit display utilized, software or applications used to receive meteorological information, and end user graphical interface issues. In March of 2012 an interim report was published and is available on the ASRS website. (https://asrs.arc.nasa.gov/docs/rs/64_ASRS_Meteorological_AIS_DataLinkStudy.pdf)

ASRS Model Applied
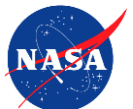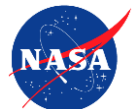
ASRS Model Applied

The ASRS model is utilized internationally in the aviation community. The International Confidential Aviation Safety Systems (ICASS) Group promotes confidential reporting systems as an effective method of enhancing flight safety in commercial air transport and general aviation operations.

International Civil Aviation Organization (ICAO) has revised Annex 13 – Accident Prevention and created Annex 19, Chapter 5, which addresses member states establishing a voluntary incident reporting system.

ASRS Model Applied to International Aviation Community

- **UNITED STATES:** Aviation Safety Reporting System (ASRS) [1976]

- **UNITED KINGDOM:** Confidential Human Incident Reporting Program (CHIRP) [1982]

- **CANADA:** Confidential Aviation Safety Reporting Program (CASRP) [1985], SECURITAS [1995]

- **AUSTRALIA:** CAIR [1988], Report Confidentially (REPCON) [2007]

- **BRAZIL:** Confidential Flight Safety Report (RCSV) [1997]

- **JAPAN:** Aviation Safety Information Network (ASI-NET) [1999], VOICES Reporting System [2014]

- **FRANCE:** Confidential Events Reporting System (REC) [2000], REX [2011]

- **TAIWAN:** Taiwan Confidential Aviation Safety Reporting System (TACARE) [2000]

- **SOUTH KOREA:** Korea Aviation hindrance Reporting System (KAIRS) [2000]

- **CHINA:** Sino Confidential Aviation Safety System (SCASS) [2004]

- **SINGAPORE:** Singapore Confidential Aviation Incident Reporting (SINCAIR) [2004]

- **SPAIN:** Safety Occurrence Reporting System (SNS) [2007]
  Safety Reporting System – SEPLA (SRS) [2007]

- **SOUTH AFRICA:** Civil Aviation Hazard Reporting System (CAHRS) [2013]

ASRS Model Applied to International Aviation Community

United Kingdom
CHIRP (1982)

Russia
VASRP

Germany
EUCARE

Japan
ASI-NET (1999)
VOICES (2014)

Canada
CASRP (1985)
SECURITAS (1995)

United States
ASRS (1976)

France
REC (2000)
REX (2011)

China
SCASS (2004)

South Korea
KAIRS (2000)

Spain
SNS/SRS (2007)

Taiwan
TACARE (2000)

Brazil
RCSV (1997)

Singapore
SINCAIR (2004)

South Africa
CAHRS (2013)

Australia
CAIR (1988)
REPCON (2007)

New Zealand
ICARUS

Current Members
Former Members

International Confidential Aviation Safety Systems (ICASS)

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ASRS Model Applications

Because of the success of ASRS, the ASRS reporting model is also being applied to other disciplines such as railroad, medicine, security, firefighting, maritime, law enforcement, and others.
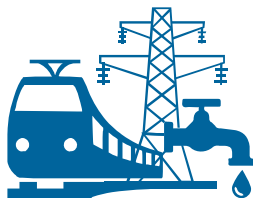
RAIL

MEDICINE

SECURITY

FIREFIGHTING

PUBLIC UTILITIES

MARITIME

STRUCTURAL ENGINEERING

ASRS Summary

ASRS Summary

ASRS is a highly successful and trusted program that has served the needs of the aviation community for over 42 years. It is available to all participants in the National Airspace System who wish to report safety incidents and situations.

The ASRS identifies system deficiencies, and issues alerting messages to persons in a position to correct them. It educates through its newsletter *CALLBACK*, its journal *ASRS Directline* and through its research studies. Its database is a public repository which serves the needs of the FAA and NASA, and those of other organizations world-wide which are engaged in research and the promotion of safe flight.
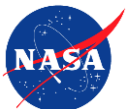
Advantages of the ASRS Model

- System-Wide Perspective

- System-Wide Alerting

- Data Processing through Expert Analysts

- Comprehensive and Time Tested Coding Taxonomy

- Strong Immunity and Legal Provisions

- Information Sharing on Safety/Security

- National and International Reputation
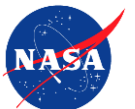
Why Confidential Reporting Works

- When organizations want to learn more about the occurrence of events, the best approach is simply to ask those involved

- People are generally willing to share their knowledge if they are assured
  - Their identities will remain protected
  - There is no disciplinary or legal consequences

- A properly constructed *confidential*, *voluntary*, *non-punitive* reporting system can be used by any person to safely share information

- Confidential reporting systems have the means to answer the question *why* - why a system failed, why a human erred

- Incident/event data are complementary to the data gathered by other monitoring systems
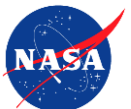
Thank You

- **Contact the NASA ASRS Director**
  - Becky L. Hooey– Becky.L.Hooey@nasa.gov

- **Additional Information & Resources**
  - Confidentiality & Incentives to Report
    https://asrs.arc.nasa.gov/overview/confidentiality.html

  - Immunity Policies
    https://asrs.arc.nasa.gov/overview/immunity.html

  - Requesting ASRS Data
    https://asrs.arc.nasa.gov/search/requesting.html